EMC Test Report

Report No.: AGC04549150801EE01

PRODUCT DESIGNATION	:	Power bank
BRAND NAME	:	
MODEL NAME	:	PB06, 1558, CPP-3794, CU1528, PL-1348
CLIENT	:	USC056
DATE OF ISSUE	:	Aug.17, 2015
STANDARD(S)	:	EN 55022:2010/AC:2011 EN 55024:2010
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Aug.17, 2015	Valid	Original Report

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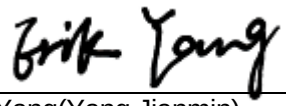
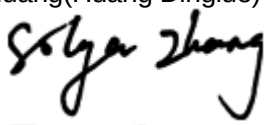
1. VERIFICATION OF CONFORMITY

Applicant	USC056
Address	
Manufacturer	USC056
Address	
Product Designation	Power bank
Brand Name	
Test Model	PB06
Series Model	1558, CPP-3794, CU1528, PL-1348
Model Difference	All the same except for the model name.
Date of test	Aug.13, 2015 to Aug.16, 2015
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-EC-IT/DC(2013-03-01)

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.
The test results of this report relate only to the tested sample identified in this report.

Tested By 
Erik Yang(Yang Jianmin) Aug.17, 2015

Reviewed By 
Rock Huang(Huang Dinglue) Aug.17, 2015

Approved By 
Solger Zhang(Zhang Hongyi) Aug.17, 2015
Authorized Officer

2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	**TEST MODE DESCRIPTION**	**WORST**
1	Discharging	V
2	Charging	--
Note: 1. V means EMI worst mode 2. only worst mode data recorded in the test report.		

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by ISO.

- Uncertainty of Radiated Emission, Uc = ±3.2 dB

4. PRODUCT INFORMATION

Housing Type	Plastic and metal
EUT Input Rating	DC 5V 550mA
EUT Output Rating	DC 5V 1000mA

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	**Number**	**Cable Description**	**Tested With**
USB	1	0.8m unshielded	1
Micro B	1	0.8m unshielded	1

5. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
PC	Apple	Macbook pro	--	--	--
5 Ohm Resistor	--	--	--	--	--
Multimeter	--	--	--	--	--

6. TEST FACILITY

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	B112-B113, Building 12, Baoan Building Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen, Guangdong, P.R.China

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	2015.07.25	2016.07.24
ANTENNA	SCHWARZBECK	VULB9168	494	2015.03.21	2016.03.20
POSITIONING CONTROLLER	MF	MF-7802	MF780208285	2015.03.06	2016.03.05

TEST EQUIPMENT OF ESD TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	Schaffner	NSG 438	782	2015.07.30	2016.07.29

TEST EQUIPMENT OF RS IMMUNITY TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
SIGNAL GENERATOR	R&S	E4421B	102525	2015.07.25	2016.07.24
ANTENNA	SCHWARZBECK	VULB9168	VULB9168-494	2015.03.21	2016.03.20
POWER SENSOR	R&S	URV5-Z4	100124	2015.07.25	2016.07.24
POWER METER	R&S	NRVD	832378/027	2015.07.25	2016.07.24
POWER AMPLIFIER	KALMUS	7100C	N/A	2015.07.25	2016.07.24
RF AMPLIFIER	Milmega	AS01004-55_55	1004793	2015.07.25	2016.07.24
HORN ANTENNA	ETS LINDGREN	3117	N/A	2015.03.21	2016.03.20

7. EN 55022 RADIATED EMISSION TEST

7.1. LIMITS OF RADIATED DISTURBANCES

AT 10M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	10	30.00
230-1000	10	37.00

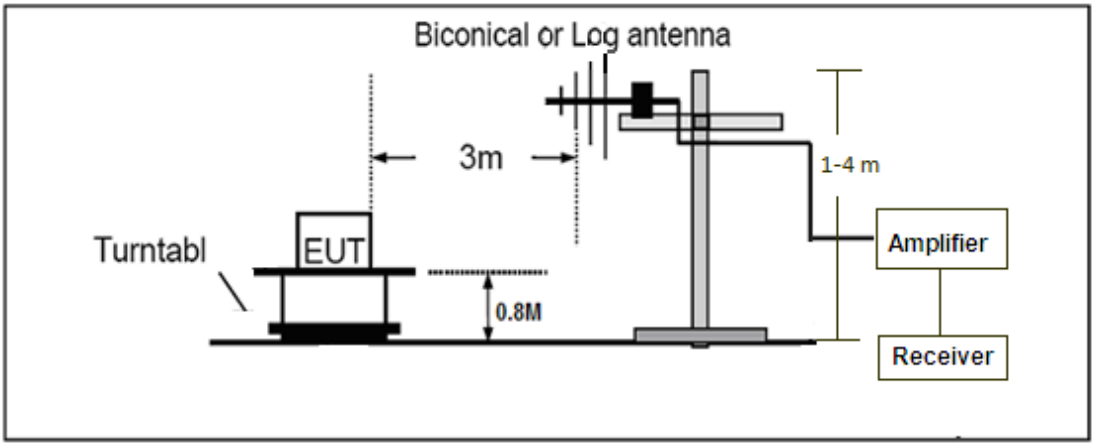
AT 3M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	3	40.00
230-1000	3	47.00

Note: The lower limit shall apply at the transition frequency.

7.2. BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators

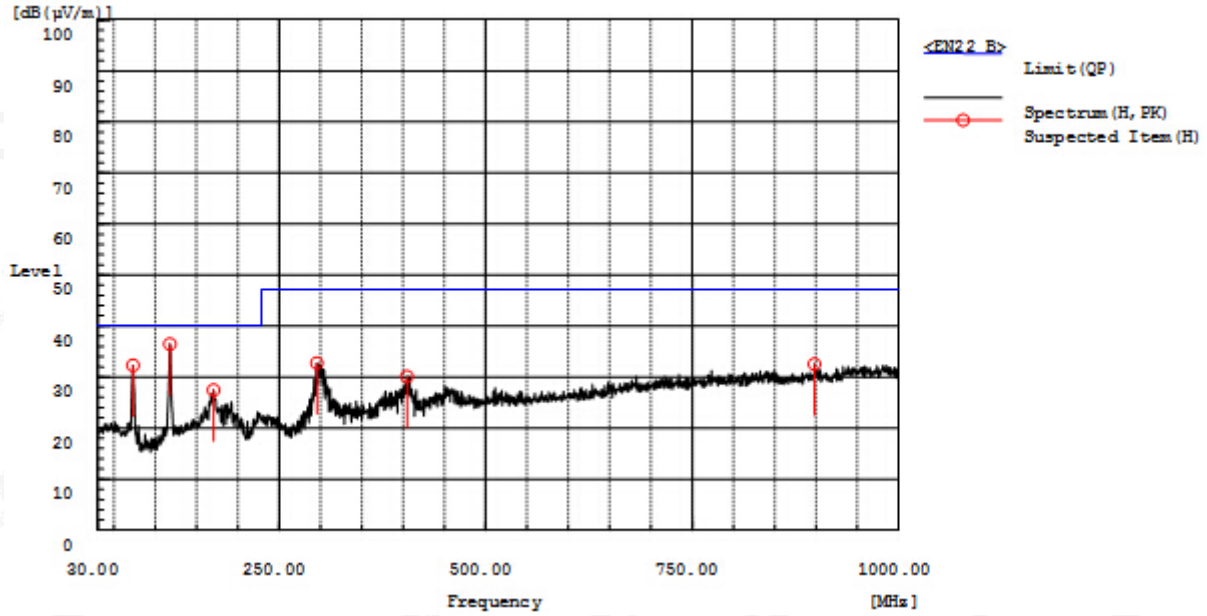


7.3. PROCEDURE OF RADIATED EMISSION TEST

(1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used).When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
(2) Support equipment, if needed, was placed as per EN 55022.
(3) All I/O cables were positioned to simulate typical actual usage as per EN 55022.
(4) The EUT was discharged from a resistor. All support equipments received AC230V/50Hz power from socket under the turntable, if any.
(5) The antenna was placed at 3 meter away from the EUT as stated in EN 55022. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
(6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
(7) The test mode(s) were scanned during the test:
(8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

7.4. TEST RESULT OF RADIATED EMISSION TEST

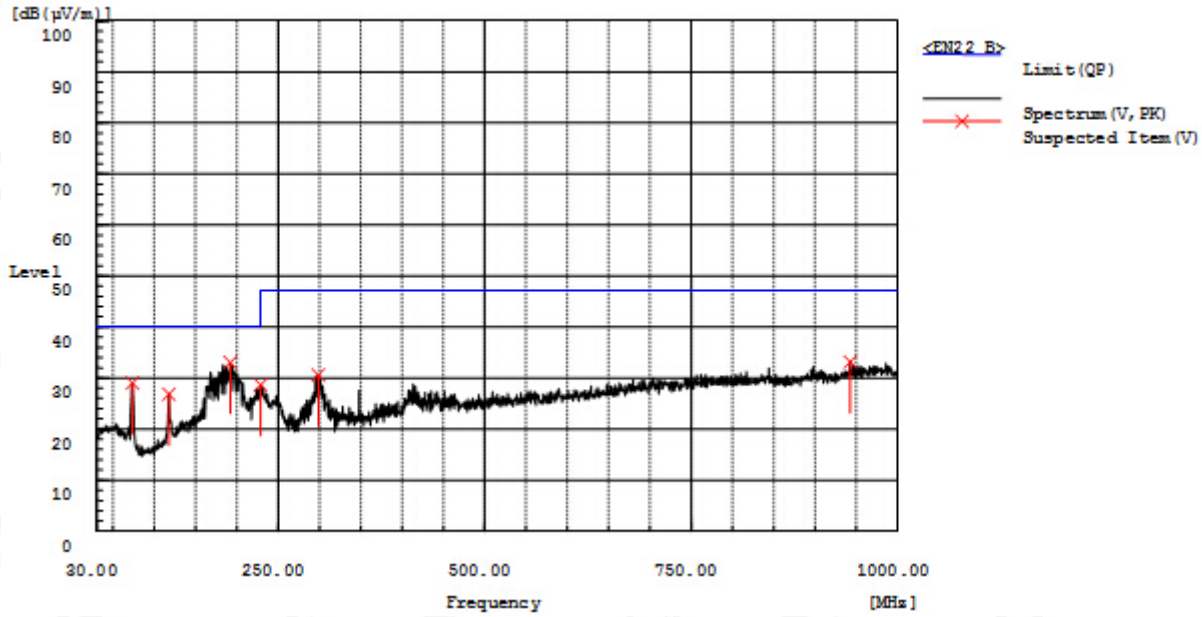
Radiated Emission Test at 3m Distance-Horizontal



Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
73.165	H	20.7	11.6	32.3	40.0	7.7	Pass	200.0	209.5
117.785	H	23.5	13.0	36.5	40.0	3.5	Pass	200.0	204.3
170.650	H	12.5	14.9	27.4	40.0	12.6	Pass	150.0	181.8
295.780	H	18.0	14.7	32.7	47.0	14.3	Pass	100.0	303.3
404.905	H	12.4	17.7	30.1	47.0	16.9	Pass	100.0	191.5
898.150	H	6.6	25.9	32.5	47.0	14.5	Pass	100.0	196.9

RESULT: PASS

Radiated Emission Test at 3m Distance-Vertical



Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
191.990	V	21.0	12.1	33.1	40.0	6.9	Pass	100.0	209.9
73.650	V	17.6	11.4	29.0	40.0	11.0	Pass	100.0	152.9
228.850	V	15.7	13.0	28.7	40.0	11.3	Pass	100.0	256.5
117.785	V	13.8	13.0	26.8	40.0	13.2	Pass	200.0	120.5
942.770	V	6.8	26.3	33.1	47.0	13.9	Pass	200.0	315.1
298.690	V	15.8	14.8	30.6	47.0	16.4	Pass	100.0	162.1

RESULT: PASS

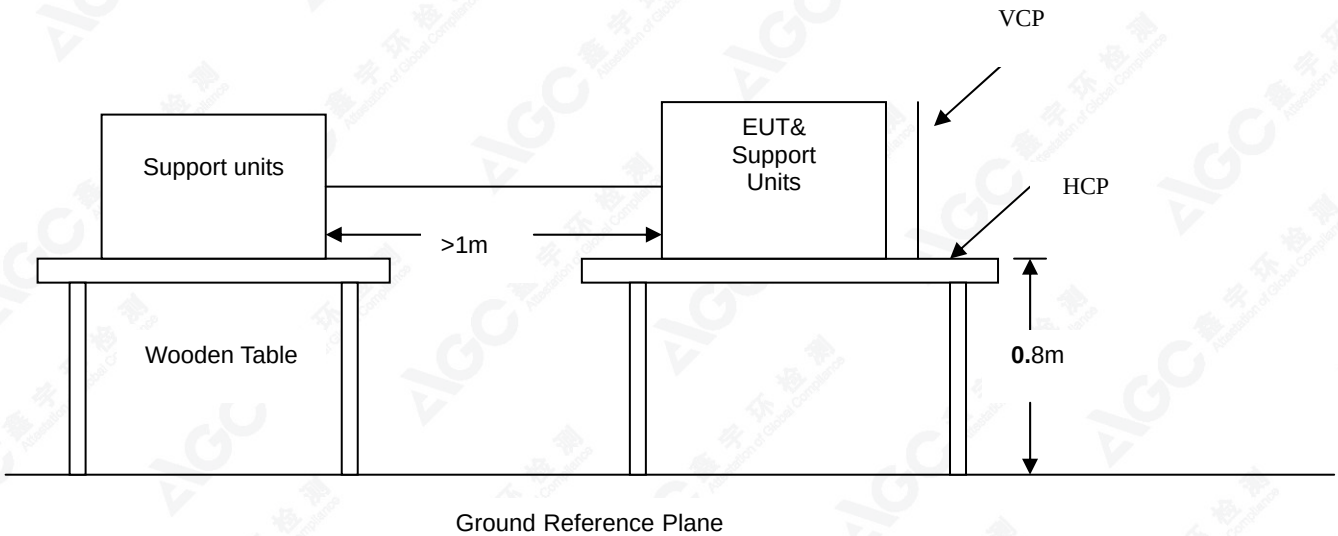
8. IEC 61000-4-2 ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	Enclosure
Basic Standard	IEC 61000-4-2
Test Level	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require	B
Tester	Erik
Temperature	20°C
Humidity	50%

8.1. BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)



Ground Reference Plane

8.2. TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.

The support units were located 1 m minimum away from the EUT.

EUT worked with resistance load, and make sure EUT worked normally.

Active the communication function if the EUT with such port(s).

As per the requirement of EN 55024; applying direct contact discharge at the sides other than front of EUT at minimum 50 discharges (25 positive and 25 negative) if applicable, can't be applied direct contact discharge side of EUT then the indirect discharge shall be applied. One of the test points shall be subjected to at least 50 indirect discharge (contact) to the front edge of horizontal coupling plane.

Other parts of EUT where it is not possible to perform contact discharge then selecting appropriate points of EUT for air discharge, a minimum of 10 single air discharges shall be applied.

The application of ESD to the contact of open connectors is not required.

Note: As per the A2 to IEC 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

The electrostatic discharges were applied as follows:

Voltage	Coupling	Test Performance	Result
±4kV	Contact Discharge	No function loss	A
±4kV	Indirect Discharge HCP (Front)	No function loss	A
±4kV	Indirect Discharge HCP (Left)	No function loss	A
±4kV	Indirect Discharge HCP (Back)	No function loss	A
±4kV	Indirect Discharge HCP (Right)	No function loss	A
±4kV	Indirect Discharge VCP (Front)	No function loss	A
±4kV	Indirect Discharge VCP (Left)	No function loss	A
±4kV	Indirect Discharge VCP (Back)	No function loss	A
±4kV	Indirect Discharge VCP (Right)	No function loss	A
±8kV	Air Discharge	No function loss	A

8.3. PERFORMANCE & RESULT

Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

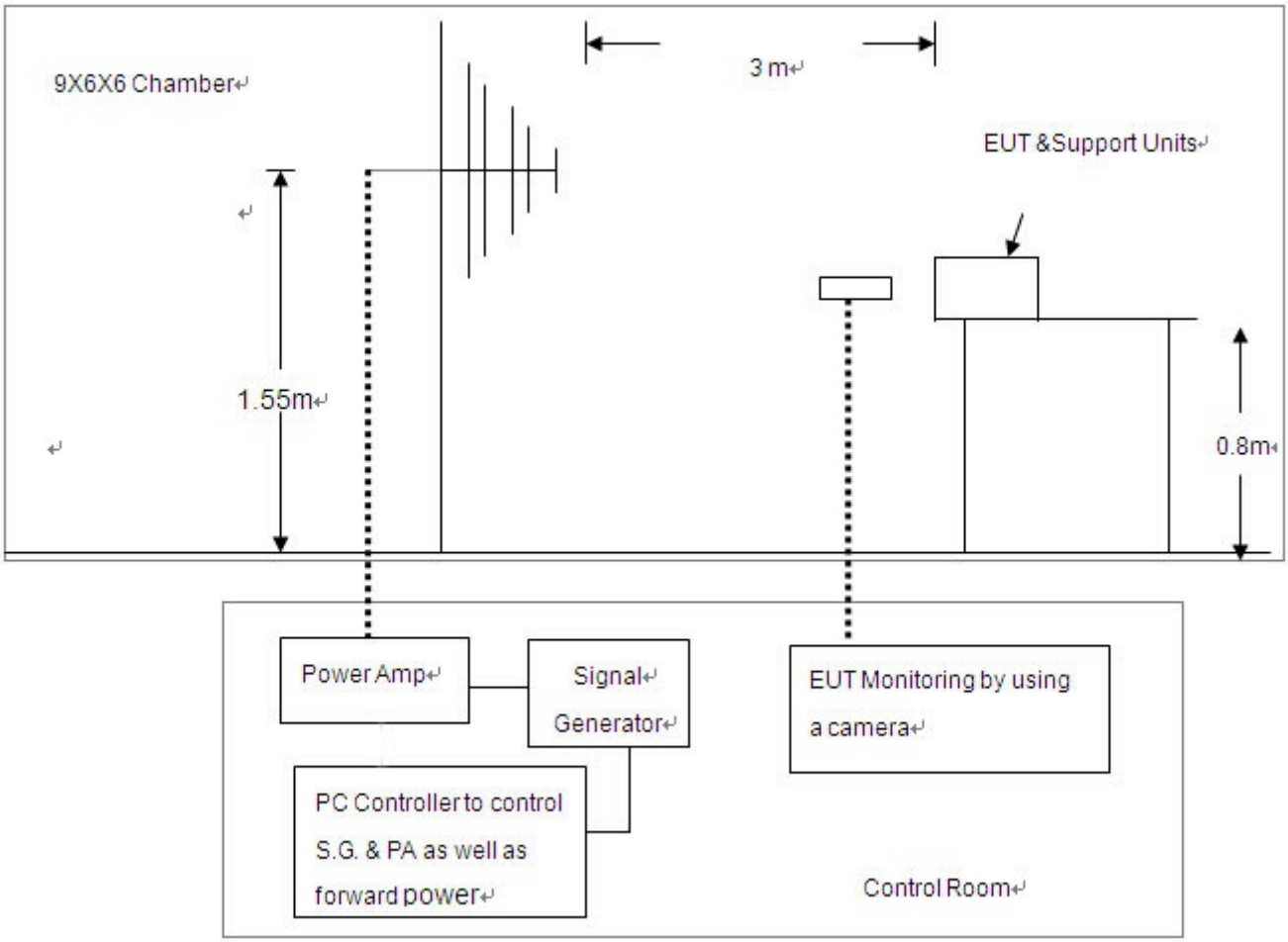
☒***PASS*** ☐***FAIL***

9. IEC 61000-4-3 RS IMMUNITY TEST

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	Enclosure
Basic Standard	IEC 61000-4-3
Test Level:	3V/m with 80% AM. 1kHz Modulation.
Standard require	A
Tester	Erik
Temperature	25°C
Humidity	55%

9.1. BLOCK DIAGRAM OF TEST SETUP



9.2. TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per IEC 61000-4-3.
EUT worked with resistance load, and make sure EUT worked normally.
Setting the testing parameters of RS test software per IEC 61000-4-3.
Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz
Recording the test result in following table.

IEC 61000-4-3 Final test conditions:

Test level: 3V/m
Steps: 1 % of fundamental
Dwell Time: 1 sec

Range (MHz)	Field	Modulation	Polarity	Position	Test Performance	Result
80-1000	3V/m	AM	H	Front	No function loss	A
80-1000	3V/m	AM	H	Left	No function loss	A
80-1000	3V/m	AM	H	Back	No function loss	A
80-1000	3V/m	AM	H	Right	No function loss	A
80-1000	3V/m	AM	V	Front	No function loss	A
80-1000	3V/m	AM	V	Left	No function loss	A
80-1000	3V/m	AM	V	Back	No function loss	A
80-1000	3V/m	AM	V	Right	No function loss	A

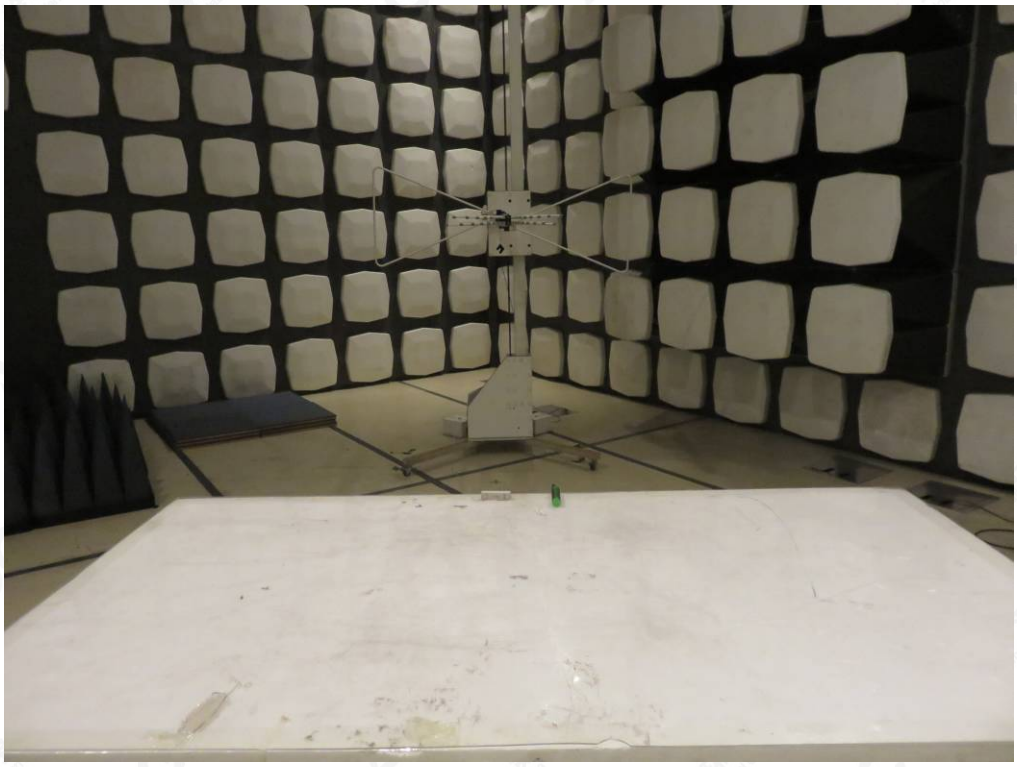
9.3. PERFORMANCE & RESULT

Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒***PASS*** ☐***FAIL***

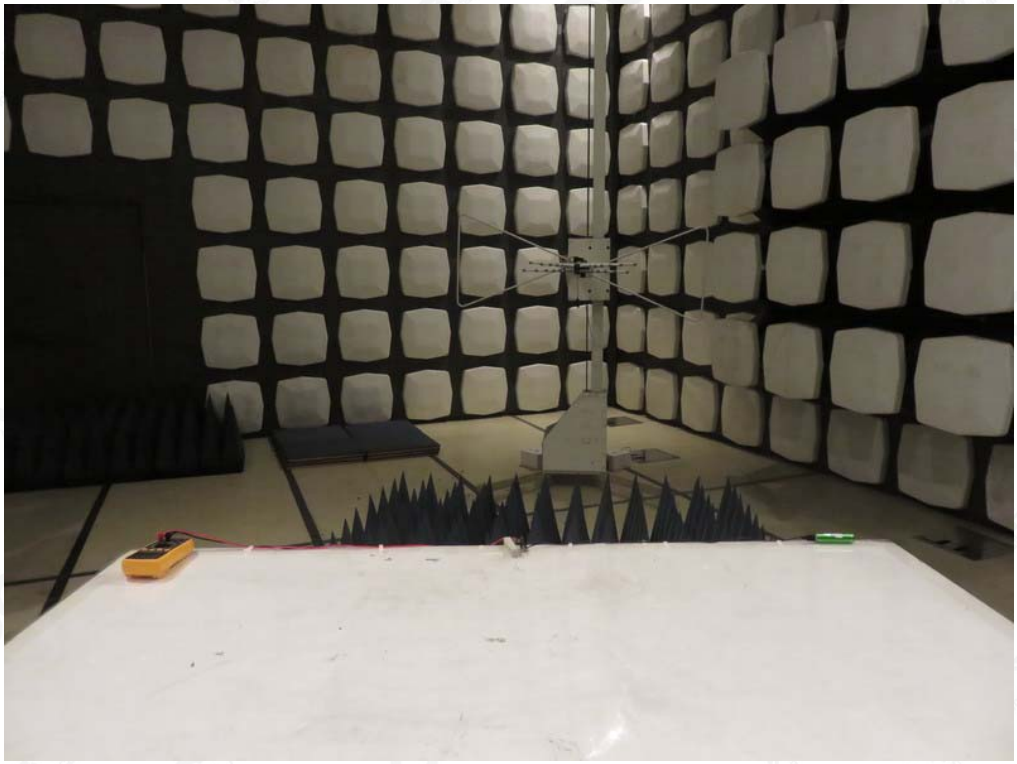
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

EN 55022 RADIATED EMISSION TEST SETUP



IEC 61000-4-2 ESD IMMUNITY TEST SETUP

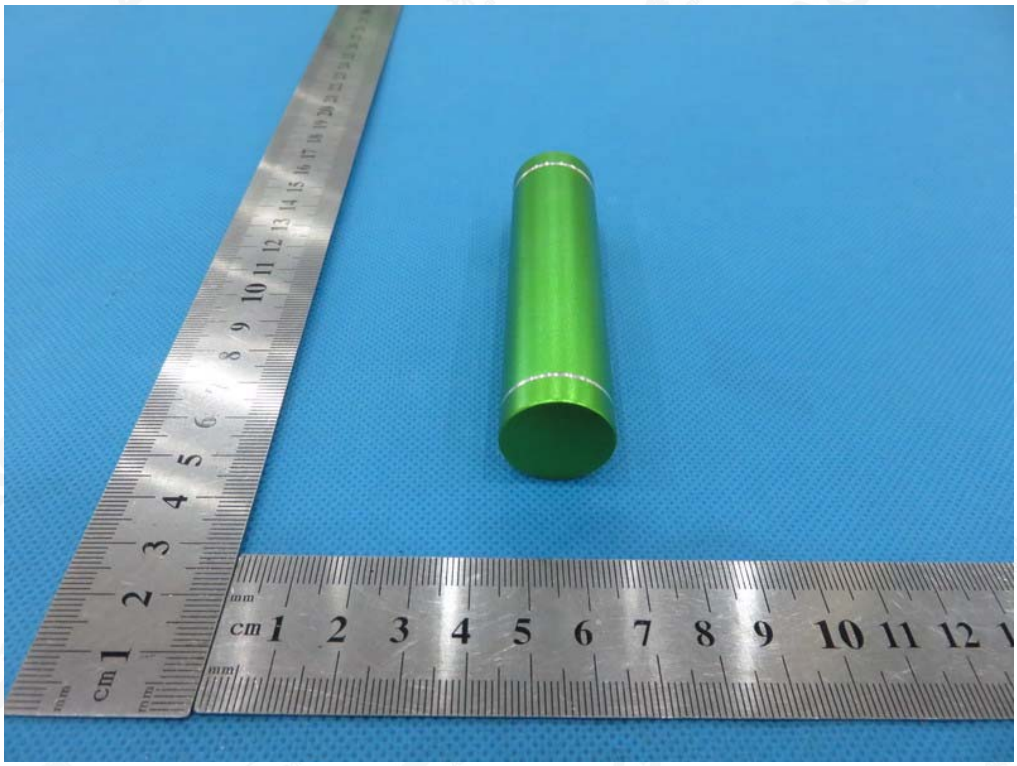
IEC 61000-4-3 RS IMMUNITY TEST SETUP



APPENDIX B: PHOTOGRAPHS OF EUT

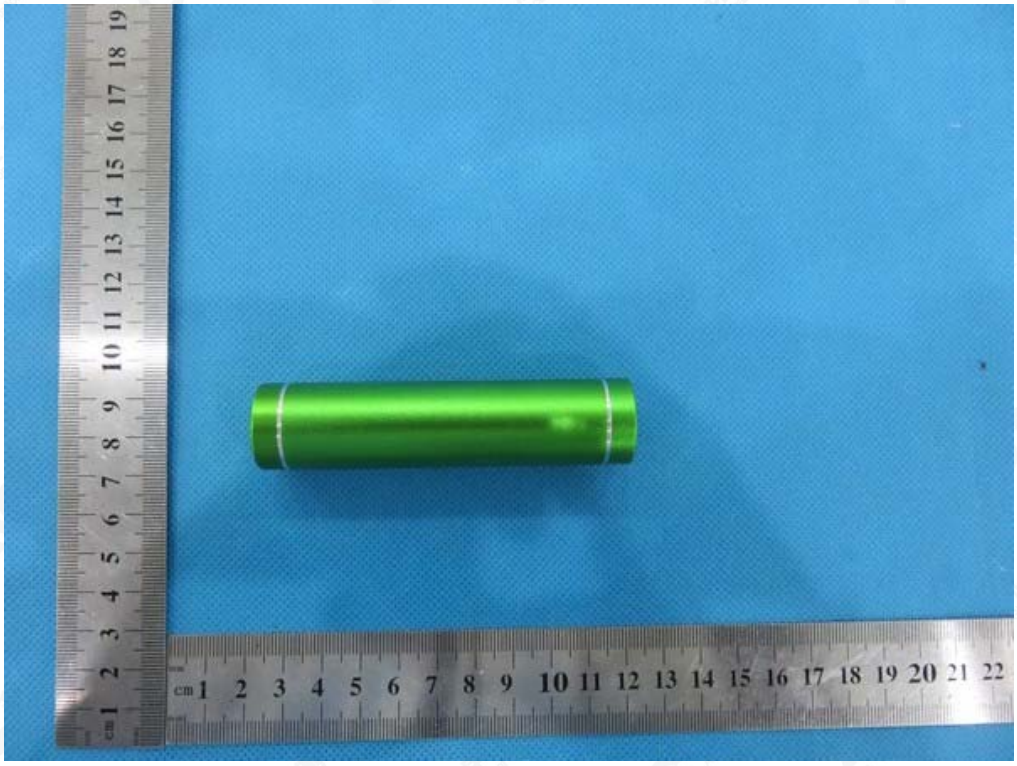
TOP VIEW OF EUT

BOTTOM VIEW OF EUT

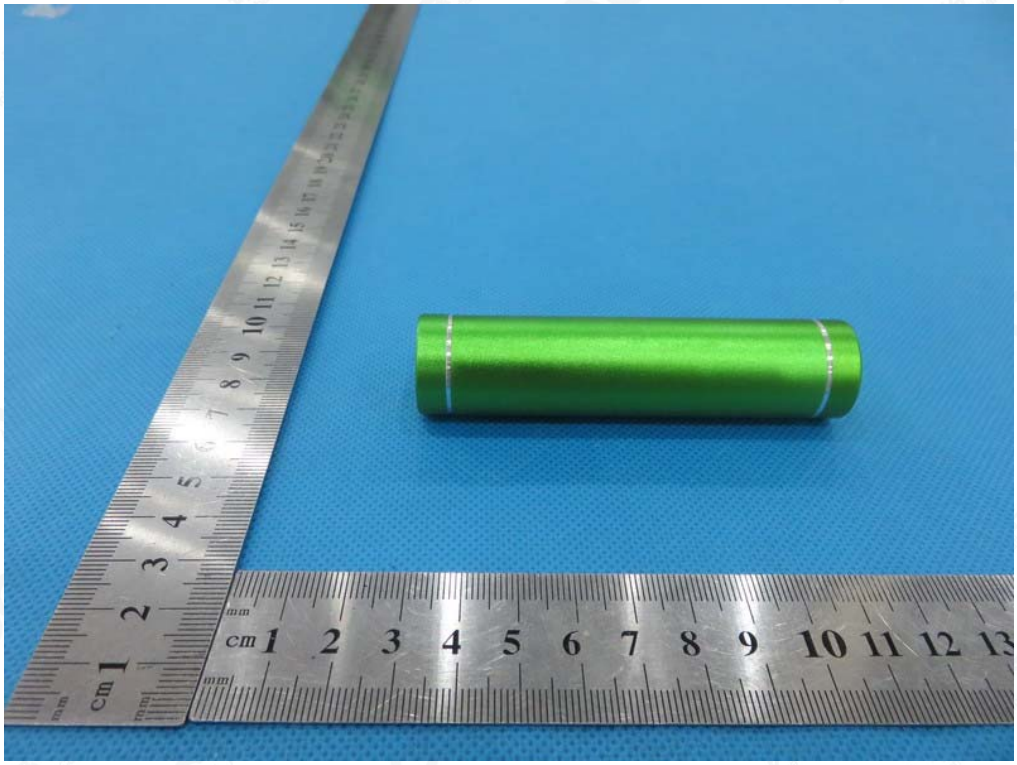


FRONT VIEW OF EUT

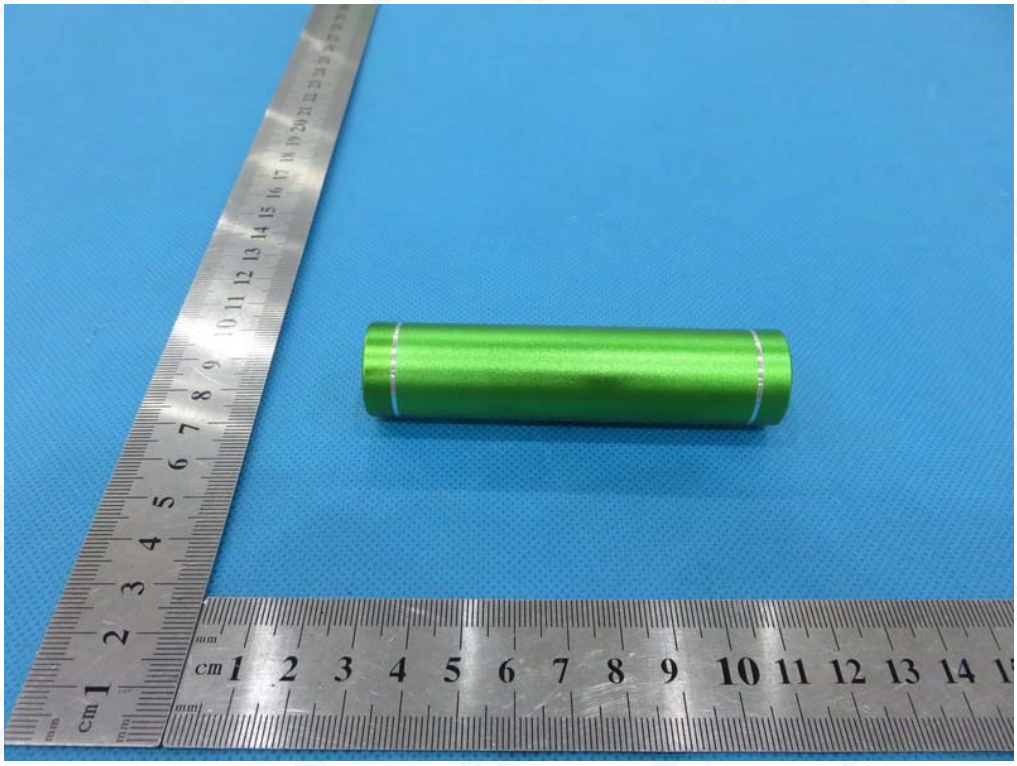
BACK VIEW OF EUT



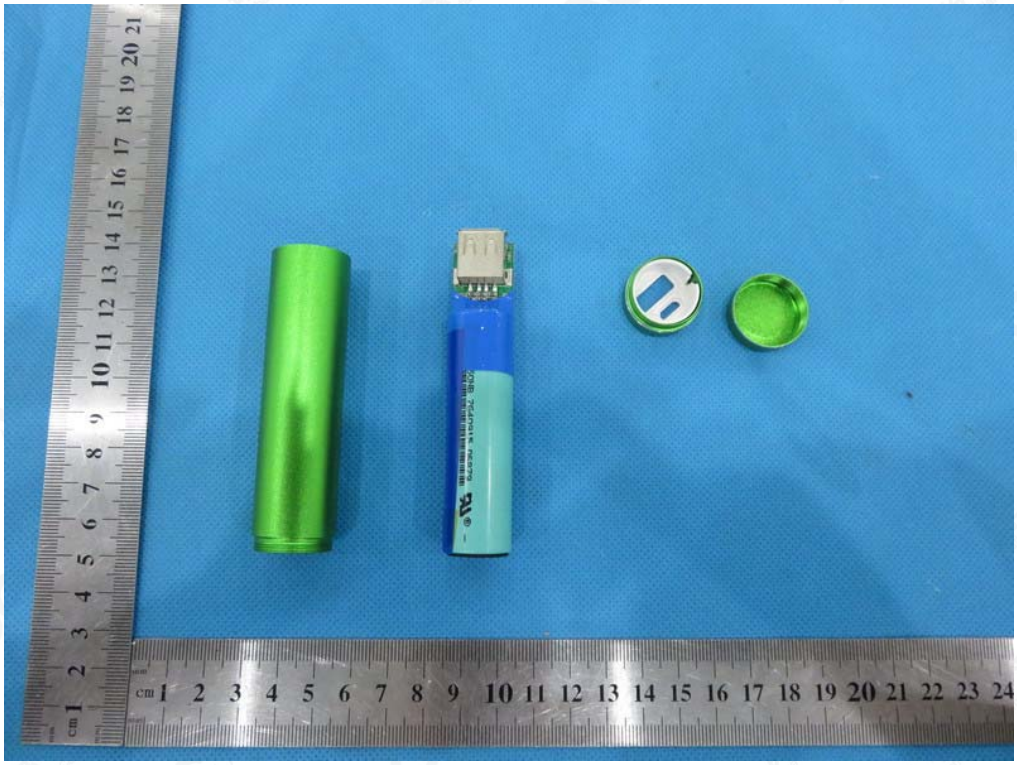
LEFT VIEW OF EUT



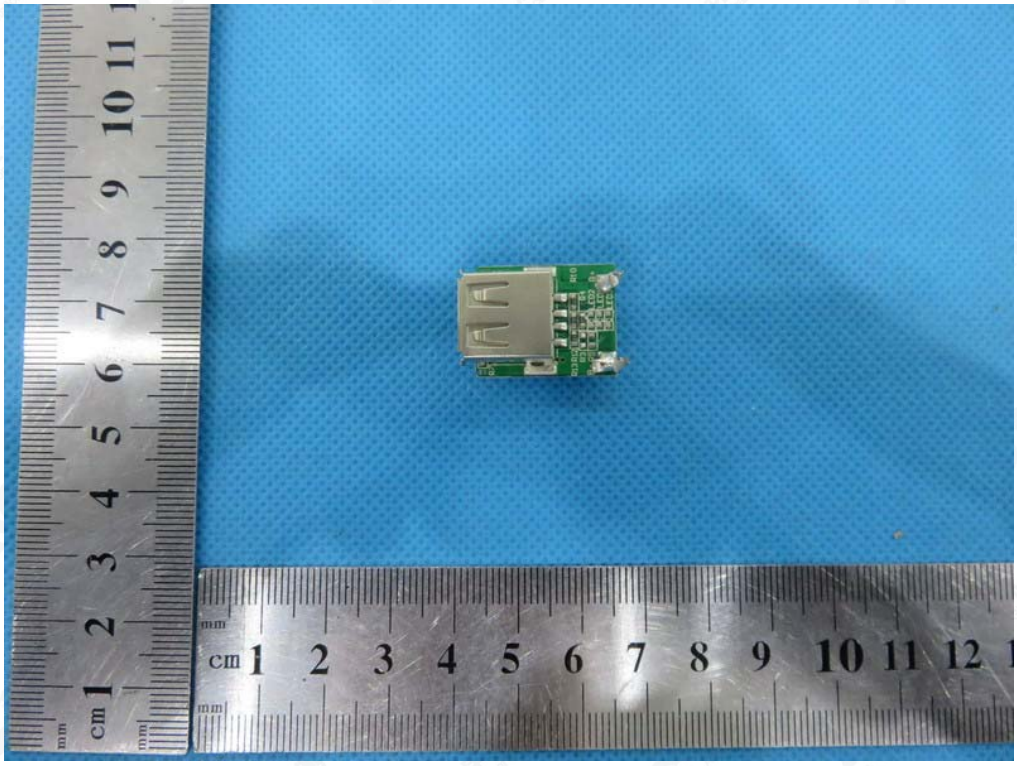
RIGHT VIEW OF EUT



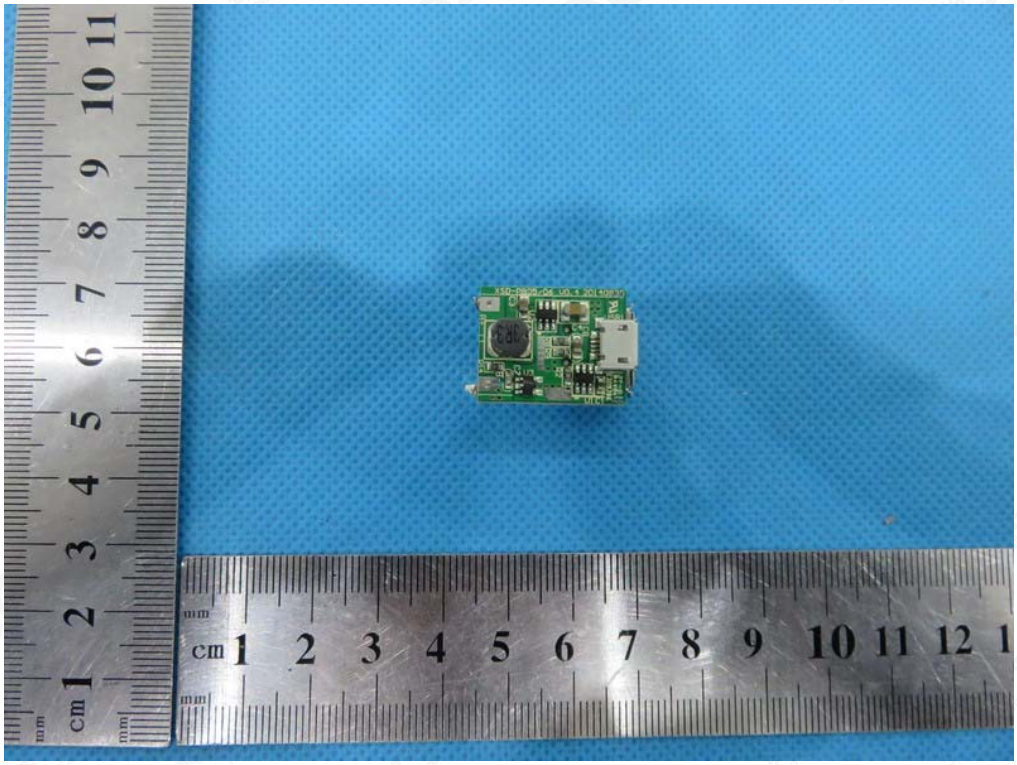
OPEN VIEW OF EUT



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



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